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board, that Mr. LICK was determined to get his telescope. We may all unite in expressing gratification that Professor DAVIDSON'S duties in the matter were performed so conscientiously and with unselfish singleness of purpose. The Lick Observatory was undoubtedly more successfully planned by virtue of Professor DAVIDSON'S help than it would have been without this help.

Professor DAVIDSON retained a strong interest in all astronomical subjects to the end. His death marked the passing of a great and useful man.

THE CORDOBA ZONES AND DURCHMUSTERUNG.¹

BY C. D. PERRINE.

In 1891 Dr. THOME commenced the observations to continue the A. G. zone catalogs from -22° to -37° . The observing work was completed in 1900. The reduction and revision work is now completed. The first 5° zone (-22° to -27°), comprising 15,975 stars, has been sent to the printer. The second 5° zone will be completed, ready for printing, by the end of the present year. The third zone will be finished about the end of 1914.

It seems highly desirable that this zone work should be extended to the pole as quickly as possible. In looking about for a quick method I have come to the conclusion that photography offers great advantages and am planning to continue the work by this means. It may be of interest to give an outline of the proposed plan.

The photographs will be taken with a doublet of 18^{cm} aperture and 110^{cm} focal length, stopped down to about 12 or 13^{cm} to cover sharply a field 5° on a side, if possible.

For the zone catalog work it is planned to take overlapping plates, as is done for the astrographic work—so that a final catalog position will be the mean of four images. This should give, with the scale adopted, a satisfactory degree of accuracy. I expect the probable error of a single image to be not over a

¹ Report presented at the Hamburg meeting of the Astronomische Gesellschaft, August, 1913.

second of arc and perhaps no more than a half second. The usual astrographic reseau will be used.

If the accuracy of the positions derived from the photographs is sufficient, it is probable that the fundamental stars will be observed with our new meridian circle, otherwise the fundamental star-places will probably be taken from the Córdoba General Catalog.

The negatives will be obtained on orthochromatic plates to approximate more nearly to the visual scale of magnitudes. Two images of each star will be obtained for measurement, with exposures of about ten minutes each. In addition, there will be made a third exposure of sufficient length to show an average 9.0 star, which will be the limiting magnitude. This third image will also serve to check the transparency and the steadiness of the air.

In the measurement of the plates, only stars will be measured which have three images. This is a plan which I have used in the work of the Córdoba astrographic zones and which has been found most useful. In the astrographic work a *fourth* exposure is used to check the transparency of the sky and the "seeing," the third exposure being just sufficient to show an 11.0 magnitude star (the limit to be measured).

The faintest star to be measured will have at least five times the exposure necessary to show the faintest image of it. This is to obtain greater accuracy in the positions, as it is known that images at the limit of vision are only composed of a few darkened silver grains which do not yield accurate positions.

It may be urged that the result aimed at in the above plan could be secured by taking the measures of the 9.0 and brighter stars of the astrographic zones and preparing a catalog. I have considered this and have come to the conclusion that the special work necessary for the zone catalog can all be done in much less time than it will take to secure the remainder of the astrographic plates and their measures.

It may be of interest to add a short account of the state of the Durchmusterung work and of the work recently undertaken at Córdoba of preparing a catalog of all of the stars of 9.5 and brighter between -82° and the pole. The positions for this catalog will be determined with the 5-inch meridi-

an circle, and the magnitudes will be determined photometrically. This catalog is intended to furnish a zone catalog of that region and also to answer for the same region in the *Durchmusterung*.

The *Durchmusterung* zone -52° to -62° is practically completed, and it is expected to begin the printing of the catalog about October 1, 1913.

It is expected to finish the original *Durchmusterung* plan by observing the region between -62° and -82° as soon as the zone -52° to -62° is completed.

The maps of the zone -22° to -42° will all have been republished about the end of the present year. The completion of the catalog for the zone -52° to -62° will make available the necessary data for the maps of -42° to -62° and these will be undertaken as quickly as possible. The remaining maps (-62 to the pole) will be completed as soon as the observations become available.

OBSERVATORIO NACIONAL ARGENTINO,
CÓRDOBA, July 12, 1913.

SETH CARLO CHANDLER.

By R. H. TUCKER.

One of the most brilliant minds in American astronomy passed away at the close of the month of December. For the greater part of his life, Dr. SETH CHANDLER had devoted his time and energy to the investigation of astronomical problems, without material support from any outside source, and without holding any scientific or university appointment. In the late sixties he had been connected with the Coast Survey, practically as a special assistant to Dr. B. A. GOULD; and in the early eighties he held an appointment at the Harvard College Observatory. During this last epoch he computed and distributed the greater part of the elements of comet orbits, with the resulting ephemerides, and kept up a service for the prompt circulation of astronomical news. The code for the transmission of astronomical telegrams, which he compiled